NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Safety Audit of Fatalities and Injuries Involving Guide Rail
RFP NUMBER: 2003-34	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker
TASK ORDER NUMBER: 99ROW1-8	PRINCIPAL INVESTIGATOR: John C. Chen Rowan University
Project Starting Date: 1/1/2004 **Original** Project Ending Date: 12/31/2005 **Modified Completion Date:**	Period Starting Date: January 1, 2005 Period Ending Date: March 31, 2005

Task	**% of Total**	**% of Task this quarter**	**% of Task to date**	**% of Total Complete**
Literature Search	5		100	5
1. Comprehensive Literature Survey	5		100	5
2. Locate and Assemble Documented information on Fatal and Injurious Accidents involving Guide Rail	20	15	90	18
3. Determine Unsolved Guide Rail Problems	10			
4. Evaluate Fatal and Serious-Injury Guide Rail Accident Sites	50	20	70	35
Final Report	10			
TOTAL	100%			63

SAFETY AUDIT OF FATALITIES AND INJURIES INVOLVING GUIDE RAIL

NJDOT Research Task Order 8
Quarterly Progress Report – March 2005

Project Objectives:

The goal of this study is to evaluate fatal and injury-causing guide rail accidents in New Jersey. The specific objectives are to:

1) Locate and assemble documented information on fatal and injurious guide rail impacts.
2) Identify all ongoing research involving guide rail accidents.
3) Determine unsolved guide rail collision problems.
4) Evaluate fatal and injury-causing impacts with guide rails in New Jersey, and recommend actions for improvements in guide rail safety performance.

Project Abstract:

Guide Rails are designed to protect vehicle occupants from trees, poles, side slopes and other hazards they may encounter in run-off road accidents. Unfortunately, a guide rail is not always a forgiving object to strike. In 2001, there were 1143 fatal crashes and 34,000 injurious crashes into guide rails in the United States.

The reasons why guide rail impacts sometimes lead to fatality or injury are complex and not completely understood. Guide rail problems include, but are not limited to, many of the following issues (1) improper installation, (2) impacts with end treatments, (3) unfavorable roadside conditions, e.g. soft soil or excessive side slope (4) side impact, (5) improper redirection after a crash, and (6) wheel snagging. Guide rail performance can be affected not only by barrier design, but also by vehicle design. Poor guide rail performance may result from (1) light trucks overturning on impact with guide rail, (2) cars "submarining" under the rail, (3) airbag-induced injuries, and (4) incompatibility with heavy trucks.

The goal of this study is to evaluate fatal and injury-causing guide rail accidents in New Jersey. The approach will be to investigate this issue through the combination of a comprehensive literature survey, interviews with roadside safety researchers on ongoing research, examination of U.S. and state accident databases, and, most importantly, site investigation of guide rail accidents which result in either fatal or serious occupant injury. The proposed research program will evaluate all fatal guide rail accidents which occur in New Jersey during the contract period, and will also examine a focused subset of guide rail accidents which result in serious, but non-fatal, injury. Implementation of the findings from this project should substantially benefit the NJDOT by providing an improved understanding of those installation or design factors which lead to guide rail related fatalities and injuries.

1. **Progress this quarter by task:**

- Meeting with NJDOT. A meeting for the project was held on December 17, 2004 at NJDOT headquarters. The PI and the Project Panel discussed the findings from the EDR guide rail investigation, results of accident investigations to date, as well as other potential guide rail crash notification avenues.

- Task 2 – Locate and Assemble Documented Information on Fatal and Injurious Accidents Involving Guide Rail.

  - Event Data Recorders (EDRs) are a new technology that can provide a comprehensive snapshot of an entire crash event. The research team has explored the use of EDR data to study guide rail performance in real-world collisions. Preliminary findings based on the available data were presented at the December 17th meeting. A report has been prepared for review by the project panel.

  - The research team is analyzing fatal and injurious New Jersey guide rail accidents based upon New Jersey highway accident statistics. Preliminary results were presented at the October 12th meeting. Additional results will be presented based on an analysis of the available police reports involving serious and fatal NJ guide rail collisions in 2003. A report documenting the findings to date is currently being prepared.

  - The research team is currently analyzing the available national data to determine national experience with fatal and injurious guide rail collisions. Also, the research team is exploring the use of specialized roadside databases such as the Longitudinal Barrier Special Study (LBSS) and the Highway Safety Information System (HSIS) to further characterize injury in guide rail collisions. Preliminary results will be presented.

- Task 4 - Evaluate Fatal and Serious-Injury Guide Rail Accident Sites.

  - The research team has investigated guide rail performance in eight crashes to date. Most recently, the team investigated a fatal end terminal impact on I-295 and a roadside guide rail impact on County Route 551 in Pedricktown. A copy of the accident investigation reports are being prepared for review by the Project Panel.

  - The research team has continued to disseminate information to towing companies in the surrounding area. Approximately 30 towing companies have been contacted so far, including areas from the Delaware Memorial Bridge to the Trenton area. To date, a total of two accident investigations have been a result of notification via a towing company.

2. **Proposed activities for next quarter by task**

    - Continue Locating and Assembling Documented Information on Fatal and Injurious Accidents Involving Guide Rail

    - Continue Investigation of guide rail collision sites

3. **List of deliverables provided in this quarter by task**

    - Summary of Task 2.4: "Event Data Recorder Data in Guide Rail Accidents"

4. **Progress on Implementation and Training Activities**

    - None Scheduled

5. **Problems/Proposed Solutions**

    - None Scheduled

Total Project Budget	122,720
Modified Contract Amount:	
Total Project Expenditure to date	96,273.54
% of Total Project Budget Expended	78.4%